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Maine Agricultural Experiment Station

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COFFEE SUBSTITUTES,
NUT OILS,
TESTING SEEDS,
POTATO POMACE.

This Bulletin contains the analyses of 8 samples of coffee substitutes, the physical constants of 13 samples of nut oils, the analyses of 102 samples of grass seeds examined in 1899 and the analyses of 2 samples of potato pomace.

Requests for the Bulletins should be addressed to the
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COFFEE SUBSTITUTES.

CHAS. D. WOODS and L. H. MERRILL.

During the last few years there has been a marked increase in the number of mixtures offered under different names as substitutes for coffee. Some of the earlier mixtures contained low grade coffee to give them flavor, but a quite exhaustive examination a year or two ago by the Connecticut Experiment Station showed them to be free from adulterations of this kind and that for the most part they are made from the cereal grains as claimed. Because of the extravagant claims made for the nutritive value of the decoctions prepared from these materials the following analyses were undertaken. The comments here made are in no wise intended to condemn these beverages but to point out that the claims for great nutritive value are not founded on fact. Whether hot beverages are or are not hygienic, a chemical study cannot show, but from the chemical composition of the infusions it is a simple task to pass upon their merits as food.

The materials here reported upon were purchased in the open market. No attempt was made to obtain samples of all of this class of preparations but it is believed that those here reported upon are fairly representative.

Description of Samples.

No. 6179. *Postum Cereal* made by Postum Cereal Company, limited, Battle Creek, Mich. This is probably the most extensively advertised of any of the coffee substitutes. The following is from statements on the package.

"A toothsome and healthful beverage. Coffee sick people seldom charge their ill feelings to the true cause. Analytical chemistry shows the poisonous alkaloids of coffee, as in tobacco, whisky and morphine. A perfectly healthy man or woman can stand these for a time, but 'constant dripping wears a stone' and finally headache, torpid liver, sick stomach or heart, and that 'weak all over' feeling show that a poisoned nervous system is calling for help and relief. Every morning and perhaps at dinner and supper another brutal blow is given. Small wonder that a fixed organic disease of some of the members is finally set up. Relief cannot be obtained unless the cause is removed."

"An honest product of the healthful grains given by all-wise nature for man's proper sustenance. It nourishes, strengthens and vitalizes."

"This natural food drink has a fragrance of its own. It is not tea or coffee, but is made from the healthful grains. Those who care to conserve their health and bodily vigor will find that the unnatural taste for tea and coffee will leave them in a few days, and a natural taste for a healthful drink will take its place."

No. 6180. *Caramel Cereal* manufactured by Battle Creek Sanitarium Health Food Company, Battle Creek, Mich. "A mixture of cereals so prepared as to constitute a wholesome substitute for coffee."

No. 6181. *Golden Grain Coffee* prepared by John A. Tibbs, Buffalo, N. Y. "Recommended by the medical profession for its nutritious and healthful properties."

"Contains the phosphorus besides other nourishment of the grain in a concentrated form."

"Children may be allowed free use of this preparation at each meal, as it is always wholesome, and in some cases may be preferable to milk."

No. 6182. *Old Grist Mill Entire Wheat Coffee,* Potter & Wrightington, agents, Boston, Mass. "Healthful and nutritious. The best substitute for coffee."

"Old Grist Mill Entire Wheat Coffee is a perfect hygienic product containing the entire wheat kernel roasted and ground."

"It aids digestion, is easily assimilated by the weakest stomach, and assists nature in preserving the complexion clear and fresh. It is in every sense a pure health food."

No. 6183. *Wheat-Shred Drink* manufactured by The Cereal Machine Company, Worcester, Mass. "A perfect food in liquid form." "Wheat-Shred Drink, is nutritive in the highest degree."

No. 6288. *Grain-o* prepared by the Genesee Pure Food Company, LeRoy, N. Y. "Grain-o is a pure food drink." "Grain-o aids digestion." "Has that rich seal brown of Mocha or Java, but it is made from pure grains and the most delicate stomach receives it without distress. It's nourishing and strengthening."

No. 6289. *Dr. Johnson's Cereal Coffee.* Wholesale and retail at Johnson Educator Food Store, No. 82 Boylston street, Boston, Mass. "A palatable, nutritious and wholesome beverage."

No. 6290. *MO-KO* prepared by John F. Bauer & Company, Mt. Morris, N. Y.

"Mo-ko aids digestion, soothes and quiets worn and wasted nerves." "Mo-ko, as a complexion beautifier, cannot be equalled. It tones the blood, and by its daily use will impart to the skin the healthful glow of youth." "Give the children Mo-ko to drink. It will make them strong and healthy, and will not injure them."

ANALYSIS OF THE WATER-SOLUBLE CONSTITUENTS OF COFFEE SUBSTITUTES.

Laboratory number.	Coffee substitute.	* Refuse.	Soluble in Water.			
			Total solids.	Protein.	Carbo-hydrates.	Ash.
		%	%	%	%	%
6179	Postum Cereal	48.8	51.2	3.1	44.9	3.2
6180	Caramel Cereal	71.5	28.5	2.0	23.8	2.7
6181	Golden Grain	77.6	22.4	4.9	13.4	4.1
6182	Old Grist Mill Coffee	64.9	35.1	5.6	26.9	2.6
6183	Wheat-Shred Drink	61.0	39.0	2.5	34.5	2.0
6288	Grain-O	53.2	46.8	2.5	42.5	1.8
6289	Dr. Johnosn's Cereal Coffee	63.7	36.3	3.3	31.3	1.7
6290	Mo-Ko	72.0	28.0	1.4	25.1	1.5

*The portions insoluble in water including the water in the preparations as sold.

From the above table it will be observed that Postum Cereal is the most soluble and Golden Grain the least soluble of the samples analyzed. The directions for preparation are quite different but in each case the coffee substitute is measured by spoonfuls and the water by cups. Measuring the material by rounded spoonfuls and assuming a cup to hold 180 cubic centimeters (about 5 cups to a quart) gives the figures in the following table:

AMOUNT OF INFUSION YIELDED BY ONE POUND OF THE COFFEE SUBSTITUTE WHEN PREPARED AS DIRECTED.

Laboratory number.	Coffee Substitute.	Liters.	Quarts.	Cups (180 cc.)
6179	Postum Cereal	10.31	10.9	57
6180	Caramel Cereal	11.34	12.0	63
6181	Golden Grain	15.12	16.0	83
6182	Old Grist Mill Coffee	32.40	34.1	180
6183	Wheat-Shred Drink	5.89	6.2	33
6288	Grain-O	6.48	6.9	36
6289	Dr. Johnson's Cereal Coffee	4.54	4.8	25
6290	Mo-Ko	3.63	3.8	20

The directions for preparation have no relation to their different solubilities, so it does not follow that the least soluble material makes the thinnest drink. For example, Caramel Cereal is less soluble than Old Grist Mill Coffee but when prepared in accordance with directions, the infusion of the former contains more than twice as much solids as that of the latter.

Skimmed milk is generally considered a pretty thin beverage but as seen from the following table it contains from three to twenty times as much solids as these so-called nutritious drinks. Wheat-Shred Drink is perhaps a fair illustration of these goods. The label claims it to be "nutritive in the highest degree" and yet one would have to drink four and one-half *gallons* of the infusion to get the amount of protein furnished by one *quart* of skimmed milk. A teacup full (1-5 of a quart) of the decoction of Postum Cereal, which it is claimed "nourishes, strengthens and vitalizes" contains about 1-7 of an ounce of solids (dry matter) and about 1-100 of an ounce of protein (nitrogenous matter). While it would take nearly 1-4 of a cup of skimmed milk to furnish this weight of solids, the protein of a cup of Postum Cereal is contained in a dessert spoonful of skimmed milk.

As stated above, the present paper has nothing to do with the hygienic question of hot or cold drinks. Viewed from the nutritive standpoint alone the following table shows that these coffee substitutes, like coffee itself, depend more for their food value upon the cream and sugar used than upon their own soluble constituents.

NUTRIENTS FOUND IN SKIMMED-MILK COMPARED WITH THOSE FOUND IN COFFEE SUBSTITUTE INFUSIONS PREPARED ACCORDING TO PRINTED DIRECTIONS.

Laboratory Number.		Total Solids.	Protein.	Fat.	Carbohydrates.	Ash.
		%	%	%	%	%
	Skimmed milk	9.75	3.50	.30	5.15	.80
6179	Postum Cereal	2.25	.14		1.97	.14
6180	Caramel Cereal	1.14	.08		.95	.11
6181	Golden Grain	.67	.15		.40	.12
6182	Old Grist Mill Coffee	.50	.08		.38	.04
6183	Wheat-Shred Drink	3.00	.19		2.66	.15
6288	Grain-o	3.28	.17		2.98	.13
6289	Dr. Johnson's Cereal Coffee	2.63	.33		3.13	.17
6290	Mo-Ko	3.50	.18		3.14	.19

NUT OILS.

L. H. Merrill.

In the summer of 1899 seventeen kinds of nuts were analyzed at this Station. The results of these analyses, together with a discussion of nuts as foods, were published in Bulletin 54. In those cases where the material at hand allowed, a sufficient amount of oil was obtained to permit a determination of the fuel value and a few other constants. Since several nut oils have already found an extended use, a contribution to the knowledge of those less known may prove of interest.

The nut kernels were finely ground and the dried material extracted with anhydrous ethyl ether. The solvent was removed by heating the solution upon the steam bath for one hour, or until the smell of ether had entirely disappeared, when the hot oil was filtered into bottles.

Several objections to this method of extraction suggest themselves, chief among which may be mentioned: (a) A possible failure to entirely remove the ether; (b) The oxidation of the oils in the final heating; (c) The presence of ether-soluble foreign matters which were present in the nuts and passed through into the oils.

Some of these dangers might have been avoided by using pressure instead of a solvent. But the use of pressure introduces another difficulty. Each of these oils consists of a mixture of from three to six or even more ethereal salts of widely varying fluidity. For this reason extraction by pressure must inevitably result in a partial separation of the oils, the less fluid remaining behind. The pressure method was employed in but one case, that of the cocoanut. It is interesting to note that in this particular instance the resulting oil (6227) differed but slightly from that obtained by ether from the same nut (6228). If a solvent be used, ether seems as little objectionable as any, since it is more readily removed from the extract than petroleum ether, and the second danger mentioned, that of oxidation, is materially reduced. As regards the third objection, the extraction of matters not oils, it should be said that so far as known there is no practicable method of extraction which would yield a mixture of pure fats. Petroleum ether undoubtedly yields an extract freer from impurities than ethyl ether, but its higher boiling point would render it more difficult to remove.

Some of these nut oils are very complex compounds. Cocoanut oil contains large proportions of trimyristin and trilaurin, smaller quantities of tripalmitin and triolein, and also the glycerides of the volatile caproic, caprylic and capric acids.* The walnut contains myristic and lauric acids, together with oleic, linolic, linolenic and isolinolenic acids.† Among the bodies not fats which frequently occurs are the lecithins, cholesterin and chlorophyl.

Of the oils here reported, those from the cocoanut and pistachio present the most marked peculiarities. Above 24° C. the former is perfectly colorless and clear as water. At the ordinary room temperature it hardens to an opaque white solid. The pistachio oil is a dark yellowish green, perhaps through the presence of chlorophyl. All the other oils are fluids at ordinary temperatures and to the casual observer present few points of difference, except as regards color, which varies from light straw to deep amber. For the most part they are without pronounced odor, though several readily suggest the nuts from which they were derived.

The instrument used in determining the refractive index was that of the Societé Genevoise, furnished for the purpose by Prof. Stevens of the department of physics of the University. The instrument permits very accurate measurements. Although from four to six readings were taken for each oil, the variations were for the most part confined to the fifth decimal, here omitted. The temperature selected was that of the room at the time the work was begun. The specific gravity was determined by a carefully calibrated pyknometer, the standard chosen being distilled water at the same temperature, 24° C. The combustions were made in a bomb calorimeter of the Atwater model, made by O. S. Blakeslee of Middletown, Conn. Even with the usual pressure of oxygen, twenty atmospheres, it was found impossible to ignite the oil directly. After several unsuccessful attempts of this kind, weighed filter blocks were used to absorb the oil. By previous experiments the fuel value of these blocks was found to be 4.130 calories per gram. For the iodine absorption number, Hubl's method,* as adopted by the Association of Official Agricultural Chemists, was employed. The great capacity of some of the oils for iodine made necessary the addition of large quantities of the iodine solution, as in the case of the walnut oil, where 70cc were used. This fact is important since the method is an arbitrary one, the amount of the absorption being to some extent affected by the excess of iodine present. The results are not, therefore, so strictly comparable as in the case of butters, where the absorption varies so little that a constant amount of iodine can be used.

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*Lewkowitsch, Oils, Fats and Waxes, p. 538.

†Ibid, p. 350.

So far as the writer is aware no study has been made of the changes which these oils undergo through rancidity. They are so susceptible to such changes that the age of the nut must to a considerable extent affect the physical and chemical properties of the oils. The work here reported was done during the summer months and the nuts must therefore have been nearly a year old.

As regards the changes which oils may undergo by heating, attention may be called to the oils from the raw and roasted peanuts (6225 and 6226). Although the roasting was carried farther than usual, resulting in a decided darkening of the oil, the constants so far as determined were practically the same. It is probable that the drying oils, containing considerable amounts of linolic, linolenic and isolinolenic acids, would have undergone appreciable oxidation under the same conditions.

The refractive index, the specific gravity, the idoine absorption number, and the calories per gram of the different nut oils here reported are given in the table on the following page.

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* Wiley's Agricultural Analyses, vol. III, page 364.

CONSTANTS OF NUT OILS.

Laboratory number.	Kind of Nuts.	Refractive index, 20°C.	Specific gravity, 24°C.	Idoine absorption number.	Calories per gram.
6216	Beechnuts, *Fagus Americana*	1.4715	.9124	97.31	9.511
6217	Brazil nut, *Bertholletia excelsa*	1.4699	.9156	90.59	9.426
6218	Butternut, *Juglans cinerea*	1.4786	.9255	129.09	9.417
6219	Filbert, *Corylus*	1.4686	.9158	82.74	9.510
6220	Hickory, *Hicoria ovata*	1.4696	.9164	102.79	9.450
6221	Pecan, *Hicoria pecan*	1.4708	.9158	99.47	9.497
6222	Pistachio, *Pistachia vera*	1.4687	.9134	83.82	9.412
6223	Pine nut, *Pinus edulis*	1.4659	.9174	105.80	9.448
6224	Walnut, *Juglans regia*	1.4770	.9224	138.84	9.438
6225	Peanut, raw, *Arachis hypogæa*	1.4701	.9136	92.51	9.750
6226	Peanut roasted	1.4697	.9142	92.37	9.577
6227	Cocoanut, *a*, *Cocos nucifera*	1.4550	.9228	6.17	9.027
6228	Cocoanut, *b*	1.4553	.9223	6.27	9.066
	Brazil nut, *c*	... .	.9182	106.20	
	Cocoanut, *d*	1.4410	.8736-.925	8.0-9.5	
	Peanut, *e*	1.4540	.911-.922	85.6-1905.	
	Walnut, *f*	1.480	.925-.928	143.-151.7	

a Extracted by ether.
b Extracted by pressure alone.
c Lewkowitsch. Oils, Fats and Waxes, p. 396.
d Ibid., p. 539.
e Ibid., p. 443.
f Ibid., p. 351.

TESTING GRASS SEED.

Chas. D. Woods.

The Legislature of 1897 entcted a law entitled "An Act to regulate the sale of agricultural seeds." This act makes it the duty of the Director of the Station to prescribe the methods to be used in examining seeds, and to "publish equitable standards of purity together with such other information concerning agricultural seeds as may be of public benefit."

The standards and methods of analysis were published as Bulletin 36 of this Station, copies of which can still be had on application.

Since the enactment of the seed law in Maine quite a number of samples (chiefly grass seeds) have been received by the Station for examination. Five grams of all the seeds submitted (excepting redtop of which only two grams were inspected) were examined. The inert matter and foreign seeds were separated by hand and then the foreign seeds classified into harmful and noxious. The inert matter and foreign seeds were weighed and the per cent calculated. The weed seeds were usually counted so as to give the number in a pound and the names of the weeds determined by comparison with sets of named seeds.

The samples of seeds received in 1898 were reported on pages 60-62 of the Report of the Station for that year. The samples examined in 1899 are here reported.

The inert matter consisted of sand, fragments of stems and leaves, chaff, whole insects, fragments of insects and insect excreta. The harmless foreign seed consisted mostly of redtop and clover in timothy, timothy, red top and clover in alsike and timothy and clover in redtop. Most of the samples examined came from outside the State and were purchased to sell as seed.

The kinds and amount of weed seeds found in the samples examined leads to the belief that seed for planting is not the only source of weeds in the State. A good many of the weed seeds found in the samples would not grow. An examination of whole grain brought in by the car-load and distributed in the State shows that it frequently carries many weed seeds. Interstate and State commerce where packing material is used are also important sources of weeds.

It will be noticed from the appended tables that the per cent of purity of seeds was for the most part high and that a large number of samples contained no weed seeds or only those that were not pernicious.

It is impossible to get a correct idea of the average per cent of purity of seed sold in the State from samples sent for examination, as one sample may represent only a few bags and another a car-load. A statement of the per cent of purity of a seed gives but little idea of its nature, as the impurities may be large and consist of harmless seeds or indifferent weeds, while one showing a low per cent of impurities may contain the vilest weed seeds.

The tables showing the results of the analyses of samples of seeds follow.

TABLE SHOWING THE RESULTS OF SEED ANALYSES INCLUDING PERCENTAGES OF PURITY, TOTAL IMPURITIES, INERT MATTER, FOREIGN AND WEED SEEDS.

Common Name.	Number of samples examined.	Samples free from inert matter.	Samples free from foreign seeds.	Samples free from weed seeds.	Highest per cent of purity.	Lowest per cent of purity.	Average per cent of purity.	Highest per cent of impurity.	Lowest per cent of impurity.	Average per cent of impurity.	Per cent of weed seeds.	Per cent of inert matter.
Red Clover	24	1	2	2	100.0	96.3	99.67	3.7	......	.33	.48	.24
Alsike	17	2	....	4	99.9	96.2	98.87	4.0	.1	1.13	1.34	.36
Timothy	38	3	8	10	100.0	97.9	99.26	2.1	.....	.74	.29	.53
Redtop	14	...	6	6	99.8	90.66	96.51	9.33	3	3.49	.92	2.58
Orchard Grass	2	...	...	....	97.90	97.72	97.81	2.28	2.10	2.19	.46	1.73
Kentucky Bluegrass	1	....	...	....	98.2	98.2	98.2	1.8	1.8	1.8	.35	1.45
Hungarian Grass....	4	....	1	1	99.84	98.5	99.31	1.5	.16	.69	.42	.27
Wheat	1	1	1	1	100.0	100.0	100.0	...	.....	......	......	.....
Lawn Grass Mixture	2	....	....	...	97.20	83.70	90.45	16.3	2.8	9.55	.4	1.41

TABLE SHOWING THE KIND OF WEED SEEDS FOUND IN SAMPLES OF SEEDS EXAMINED.

Common Name.	Technical Name.	Name of Samples Examined and Number.								
		Red clover.	Alsike.	Timothy.	Redtop.	Orchard grass.	Kentucky bluegrass.	Hungarian grass.	Wheat.	Lawn grass mixture,
		24	17	38	14	2	1	4	1	2
Hedge Mustard	Sisymbrium officinale	....	1	3	....	...	....	....	....	....
Black Mustard	Brassica nigra	1	....	1	....	....	....	....	..	....
Shepherd's Purse	Capsella bursa-pastoris	1	2	9	1	....	....	....	....	....
Wild Peppergrass	Lepidium virginicum	....	5	9	1	1	....	....	...	....
Chickweed	Stellaria media	....	...	...	1	...	....	....	....	....
Evening Primrose	Œnothera biennis	....	1	16	....	....	....	....	...	....
Five-Finger — Cinque Foil	Potentilla monspeliensis	....	1	18	2	...	....	....	....	....
Cone Flower—Yellow Daisy	Rudbeckia hirta	....	1	24	3	....	....	...	....	1
May Weed	Anthemis cotula	1	2	1	1	....	...	1	....	....
Roman Wormwood	Ambrosia artemesiæfolia	1	....	....	....	....	...	1	...	....
Blue Verbena	Verbena hastata	...	....	16	2	....	1	2	....	....
Catnip	Nepeta-cataria	....	1	....	....	....	....	....	..	....
Heal All	Brunella vulgaris	2	....	...	....	...	....	....	....	....
Dooryard Plantain	Plantago major	1	2	3	...	...	....	....	....	....
Rugel's Plantain	Plantago rugellii	15	4	17	6	....	....	1	..	....
English Plantain	Plantago lanceolata	11	1	2	....	....	....	....	....	....
Awned Plantain	Plantago aristata	6	....	1	....	..	....	....	....	...
Prostrate Pigweed	Amaranthus flitoides	2	...	....	....	....	....	....	....	....
Rough Pigweed	Amaranthus retroflexus	3	3	3	....	....	....	2	..	...
Goosefoot	Chenopodium album	7	7	23	....	....	....	1	....	...
Sorrel	Rumex acetosella	12	14	5	4	....	....	...	....	2
Pennsylvania Smartweed	Polygonum Pennsylvanicum	19	1	...	1	1	....	2	....	1
Lady's Thumb	Polygonum persicaria	4	....	1	....	....	....	1	....	....
Black Bindweed	Polygonum convolvulus	1	....	1	1	1	....	1	....	....
Yellow Foxtail	Setaria glauca	20	4	....	....	....	....	2	....	...
Green Foxtail	Setaria viridis	2	1	1	....	....	....	....	....	....
Willow Leaved Dock	Rumex salicifolia	5	3	....	...	....	....	....	....	....
Curled Dock	Rumex crispus	...	....	1	....	....	...	...	....	....
Tall Buttercup	Ranunculus acris	....	....	...	....	....	....	...	....	1
Catchfly	Silene	....	1	....	...	....	....	....	...	....
Common Chickweed	Stellaria media	1	3	....	....	....	....	....	....	1
Clustered Dock	Rumex conglomeratus	1	1	....	...	....	....	....	...	....
Sprouting Crab-grass	Panicum proliferum græcizan	1	....	...	....	....	....	1	...	....
Tumble-weed	Amaranthus	...	....	....	....	....	....	....	...	....

POTATO POMACE.

J. M. Bartlett.

Potato pomace is the residue which is left in the manufacture of starch from potatoes. This material contains nearly all the fiber, protein, fat and a large part of the starch found in the fresh potato.

As it comes from the factory it is necessarily incorporated with a large amount of water through the method of manufacture. The process in general use in this country and Europe is briefly stated as follows:

The tubers after being thoroughly cleansed of all dirt are placed in iron grinding cylinders with saw teeth which lacerate the cells, setting the starch granules free. The ground mass is then washed with cold water on sieves placed over tanks, the starch granules passing through and settling out in the bottom of the tank while the pulp passes off with another portion of the wash water. As this pulp residue all goes to waste in this country the process is necessarily a wasteful one, and manufacturers have been giving some thought to devising a method of recovering it. The chief obstacle to its use in the fresh condition is the large amount of water it contains. If some method could be devised for cheaply removing the larger part of the water, the dry matter would have considerable value as a feeding stuff. Of course, the material could be fed with 80 to 90 per cent of water present, but in this condition it would keep but a short time, and as the period for manufacturing starch extends over but a few weeks of the year it would be available for only a very limited time for food; dried, however, it would keep any length of time.

In Europe the potato and beet residues from the manufacture of alcohol are quite extensively used as feeds in the wet condition, 80 to 125 pounds being fed to cattle daily per head. This material probably does not vary greatly in composition from the starch factory residue, but the manufacturing is conducted on a small scale, usually by the farmers themselves, and extends over quite a long period so this pomace can be conveniently fed out in the wet state.

Two samples of potato pomace have been sent to the Experiment Station for analysis to determine their value. One was from a New Sweden factory and the other from Houlton. The results of the analysis are given in the following tables:

TOTAL FEED NUTRIENTS IN POTATO POMACE.

	FRESH MATERIAL.						WATER-FREE.				
	Water.	Ash.	Protein.	Fiber.	N-free extract.	Fat.	Ash.	Protein.	Fiber.	N-free extract.	Fat.
New Sweden Sample.....	88.36	.36	.970	1.35	8.990	.070	3.02	7.36	11.52	77.52	.58
Houlton Sample.....	95.11	.16	.40	.55	3.75	.04	3.19	8.16	11.26	76.60	.79

TOTAL FERTILIZING ELEMENTS IN POTATO POMACE.

FRESH MATERIAL.				WATER-FREE.		
Water.	Nitrogen.	Phosphoric acid.	Potash.	Nitrogen.	Phosphoric acid.	Potash.
88.36	.117	.029	.115	1.18	.25	.97
95.11	.064	.013	.071	1.31	.26	1.46